

Importance-Performance Analysis for National Forests and Grasslands

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Introduction

The Government Performance and Results Act (Public Law 103-63) requires that each Federal agency submit to Congress a five-year Strategic Plan. The Plan is to include long-term goals and objectives. Identifying the long-term goals and objectives is one of the most critical aspects of Strategic Planning. The Results Act requires an agency to ask for the views and suggestions of anyone "potentially affected by or interested in" its Strategic Plan. The long-term goals and objectives of the Strategic Plan must therefore reflect not only the agency's mission, but also the public's views and suggestions for our country's public lands.

The USDA Forest Service completed its Strategic Plan (2000 Revision) in October 2000. The goals and objectives included in the Plan were developed by the agency with input from the public. This input was obtained in several ways, one of which was through a telephone based survey concerning objectives for the management of forest and grasslands, and public attitudes toward USDA Forest Service job performance fulfilling these objectives.

The survey results are helping the USDA Forest Service understand the public's objectives as well as provide useful insight into the public's level of satisfaction with the USDA Forest Service's performance fulfilling these objectives. This paper attempts to take this work a step farther by analyzing and graphically displaying which objectives the public has determined to be most important, and how satisfied the public is with the agency's performance surrounding these objectives. By scaling both of these ratings and combining the results, it is possible to identify the objectives that are most in need of management attention, according to the public. This technique will also allow the agency to view which objectives they are addressing that the public views as a lower priority. With this type of information, managers will be able to make decisions that more fully

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reflect the objectives of the public at large. The importance-performance analysis technique is applied in order to gather this information.

Importance-Performance Analysis

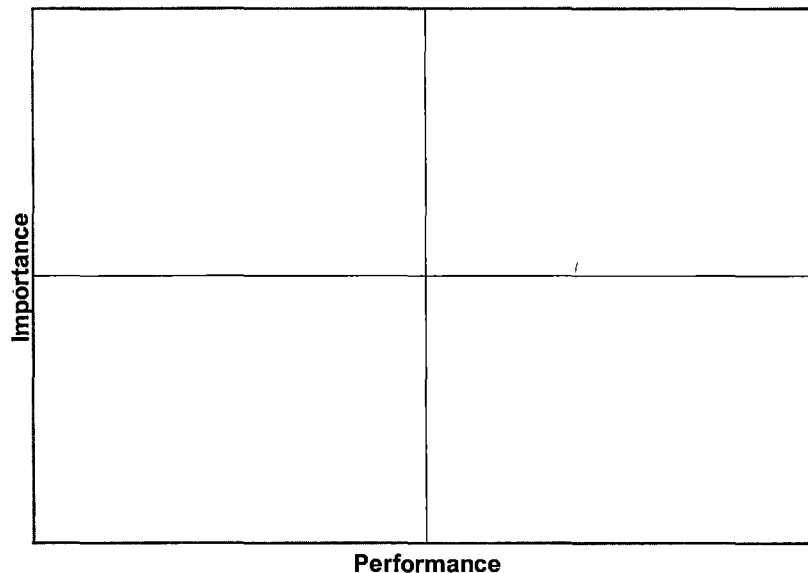
First described in the marketing literature by Martilla and James (1977), the importance-performance analysis has more recently been applied to recreation and public lands studies. The importance-performance analysis has been described and/or used in such studies as Guadagnolo's (1985) work on the evaluation and marketing of recreation services, Richardson's (1987) examination of perceptions of communication effectiveness as held by employees of a large Midwestern county parks and recreation department, Havitz, Twynam, and DeLorenzo's (1991) article on importance-performance as a method of Parks and Recreation staff evaluation, Hollenhorst, Olson, and Fortney's (1992) work on recreation within an eastern national forest, Leeworthy and Wiley's (1994, 1995, 1996) and Wiley and Leeworthy's (1998) research on profiles of visitors to public lands, and Marcouiller and Mace's (1999) research on forests and regional development in Wisconsin.

As described by Martilla and James (1977), understanding perceptions of importance and performance are essential for understanding consumer satisfaction (be they consumers of products or users of public lands). This is in part due to the fact that satisfaction is related to both certain attributes and judgments of attribute performance. Thus, the importance-performance analysis addresses a need for an indication of satisfaction that stems from the public's expectations and judgments of performance (Propst and Lime 1982; Mengak, et al. 1986; Marcouiller and Mace 1999).

Importance-Performance Analytical Framework

The importance-performance analysis is a useful analytical framework provided in a four-quadrant presentation. Placing the importance measurement on the vertical axis and the performance measurement on the horizontal axis forms this framework. (See Figure 1).

Figure 1: Importance-Performance Graph



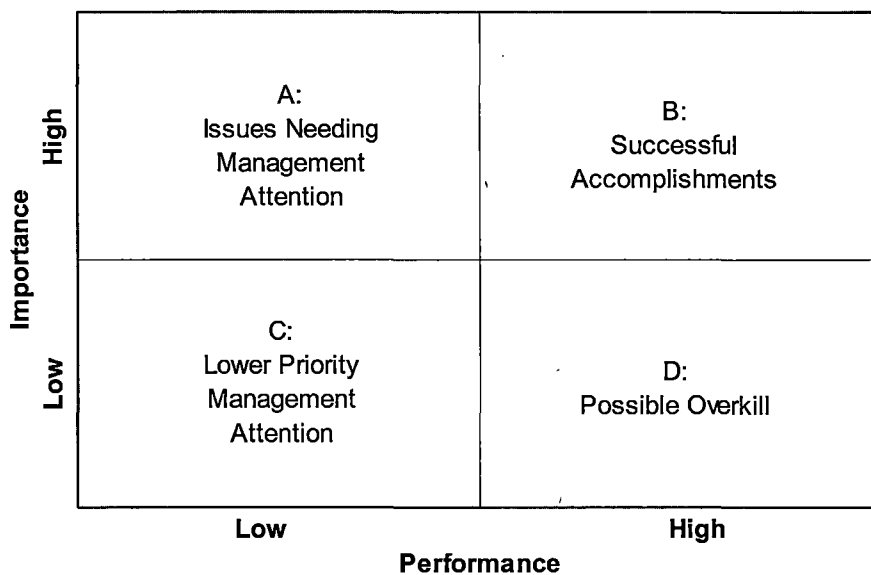
The axes are created by vertical and horizontal lines placed either at the mid-point of each measurement scale, or at the respondents' mean score for importance and performance. Positioning the axes for the grid at either the mid-point of the importance and performance scales or at the respondents' means scores for importance and performance is a matter of judgment. Both methods reveal useful information. Placing the axes at the mid-point of the scales reveals the responses given degrees of importance and performance, thus showing an absolute value of importance-performance. Taylor and Douglas (1999) utilized this method in their work on river management. On the other hand, placing the axes at the mean value identifies the importance-performance for each item relative to the other items. This approach reveals the relative rather than the absolute levels of importance and performance. Thus, even if all respondents gave high scores to all items, it would still be possible to judge the relative importance and performance scores and thus establish priorities (Leeworthy and Wiley 1996, 2). Because much natural resource satisfaction data is negatively skewed—most responses fall into the higher part of the range of satisfaction scores—positing the axes at the mean score may be sensitive to the lack of a normally distributed dataset (Tarrant and Smith 2002, 80). Leeworthy and Wiley (1996), Wiley and Leeworthy (1998) and Marcouiller and Mace (1999) have placed the axes at the mean in their work on recreation and public lands issues.¹

¹ There also are some discussions concerning placing the axes at the median or at the mean. Median values as a measure of central tendency may be preferable because a true interval scales may not exist (Martilla and James 1977). However, using the means avoids discarding additional information and since tests of significance are not utilized, “distortions introduced by minor violations of the interval-scale assumption are unlikely to be serious” (Martilla and James 1977, 79). In addition, placing the axes at the means shows the relative levels of importance and performance; placing the axes at the median divides the items into equal groups, a technique that does not reveal additional information for the importance-performance analysis.

Quadrants

The axes form the cross hairs that divide the graph into the four quadrants. This framework (adapted from Martilla and James, 1977; Marcouiller and Mace, 1999) provides a simple but easy-to-interpret visual of the results. (See Figure 2).

Figure 2: Graph of Management Implications for the Interaction Between Importance and Performance



As Figure 2 shows, each quadrant is labeled according to the characteristics derived from its combination of high or low ratings for importance and performance. Items that fall into quadrant A (high importance and low performance) are the most likely to raise public controversy and thus should be of highest priority for managers. Items within quadrant B (high importance and high performance) are considered successful accomplishments and thus should be carefully maintained to assure they do not slip toward quadrant A. Remaining management resources should be allocated to items within quadrant C (low importance and low performance) because, although an item in quadrant C may not arise as a high priority, it is no doubt important to some of the public, who should not be ignored simply because they are in the minority. Finally, items within quadrant D (low importance and high performance) should be of lowest priority to managers. These are the items that are not viewed as important and yet are considered to be in good condition.

This importance-performance analysis framework is beneficial for application in natural resource management settings because its grid format makes it relatively easy for decision-makers to interpret data and the results reveal clear outcome strategies. Possible drawbacks include a suggested lack of statistical analysis, particularly as related to statistical power (Hammitt et al. 1996), a lack of a clear definition for the concept of

importance (Shores Hunt et al. 2003), and a lack of differentiation between attributes that fall squarely within the center of a quadrant, and “borderline attributes” that fall close to an axis (Tarrant and Smith 2002). This final drawback accentuates the importance of examining the graph that displays the results—the graph visually reveals the borderline attributes. Despite drawbacks, the simplicity of the importance-performance analysis makes it a desirable tool to help identify viable positions for natural resource managers.

Basic Steps to the Analysis

According to Marcouiller and Mace (1999, 9), utilization of the importance-performance analysis consists of five basic steps:

1. development of issues or attributes;
2. administration of a survey to measure the issue;
3. reporting of perceived importance and performance of each issue through the mean importance value and mean performance value;
4. plotting the mean values for each issue on a two dimensional grid; and
5. assessing the issues based on location within the grid.

Our work followed this five-step process.

Data

Understanding the value of looking at both importance and performance ratings is the first step to gaining a better understanding of consumer satisfaction. However, determining what attributes to measure is an equally, if not more important element to further this understanding. If, for example, factors important to the consumer are overlooked, the usefulness of an importance-performance analysis will be limited. In order to work around this type of concern, the attributes used in this analysis were determined with a number of techniques, including individual interviews, focus groups and objective hierarchies. Among other things, these sources provided guidance for narrowing the attribute list down to a manageable size in order to avoid low response rates and unnecessary data manipulation. Furthermore, the information collected identified five strategic level objectives, or over-arching objectives for forest and grassland management. These five strategic level objectives include: access, preservation/conservation, economic development, education, and natural resource management.

Survey

Data for this report comes from the USDA Forest Service’s Values Objectives Beliefs Attitudes (VOBA) survey. The survey was implemented as a module of the National Survey on Recreation and the Environment (NSRE). This random telephone survey was administered for the USDA Forest Service by the University of Tennessee between the fall of 1999 and summer of 2000.² The VOBA survey is comprised of statements to which respondents indicate their level of agreement or approval in four areas: values,

² Although properly administered, it is important to note limitations of telephone surveys. Telephone surveys, such as the NSRE, will not adequately represent the views of segments of the population who do not have access to or who choose not to have telephones. Furthermore, respondents are self-selecting, due to the fact that they chose to answer the call and take the time to respond to the survey.

objectives, beliefs and attitudes regarding forests and rangelands.³ This paper focuses on two of the VOBA areas: objectives and attitudes. Objectives statements ask respondents if they thought the objective was important and attitude statements ask respondents if they were satisfied with the management performance concerning the objective. The VOBA survey includes 30 statements for each objectives and attitudes. See Appendix A for a list of the statements and Appendix B for the statements and their corresponding strategic level objectives..

Sample size for the survey was 7069. As a result of a limited amount of time available for each phone interview, participants were asked to respond to only a portion of the full VOBA set of questions, although each responded did receive at least one question concerning each of the five strategic level objectives.⁴ Due to this sampling design, each item in the objectives and attitude scales has fewer than the full 7069 respondents.

This paper focuses on two of the VOBA areas: objectives, which shows the level of importance respondents place on each issue, and attitudes, which shows the respondents' level of satisfaction for each issue. For the objectives, respondents indicate how important they consider the objective on a five-point scale. The objectives scale items are anchored by 1=not at all important and 5=very important. Likewise, respondents indicated how they view management performance to achieve the objective on a five-point scale where 1=very unfavorable and 5=very favorable.

Methods

The statistical methods used for this work consisted of basic descriptive statistics: means, standard deviations, and sample sizes. In addition, frequency distributions were run and histograms created in order to detect any patterns among individuals' responses for each item. This is a necessary step because, for example, a large standard deviation shows that there is a substantial amount of variation within the responses. This substantial variation can be due to many respondents varying to a smaller degree, or few respondents responding in the extreme. A histogram visually presents the data from individual responses, thus revealing the presence of patterns such as polarized responses (i.e., respondents answering in the extremes).

³ VOBA statements were generated through interviews and focus groups with public stakeholders. The information collected from interviews and focus groups was compiled into an objectives hierarchy containing five strategic level objectives consistently revealed by the focus group participants. These five strategic objectives are: Access, Preservation/ Conservation, Economic Development, Education, and Natural Resource Management. For more information on the development and results from the VOBA survey, see Shields, Martin, Martin, and Haeffle, 2002.

⁴ The overall goal of this split sampling design was to control interview time with respondents, yet collect analytically valuable information. This not only lowers costs, but also reduces respondent burden, which should lead to less unit non-response and therefore to a better sample quality. In order to ensure high confidence levels, the full national survey was designed so that there was a minimum of 700 responses for each question. This design generates response numbers for each question that are adequate to support multivariate statistical analysis and provide a high level of confidence in the results. For more information on split sampling designs, see for example, Raghunathan, T.E. and Grizzle, J.E. 1995. "A Split Questionnaire Survey Design," *Journal of the American Statistical Association*, 90: 54-63.

The four-quadrant framework is utilized to complete the importance-performance analysis. For our purposes, the axes were set at the aggregate means. As noted above, this reveals additional information, showing relative importance and performance relationships across the 30 items. The plotted scores represent a group mean for each of the 30 issues.

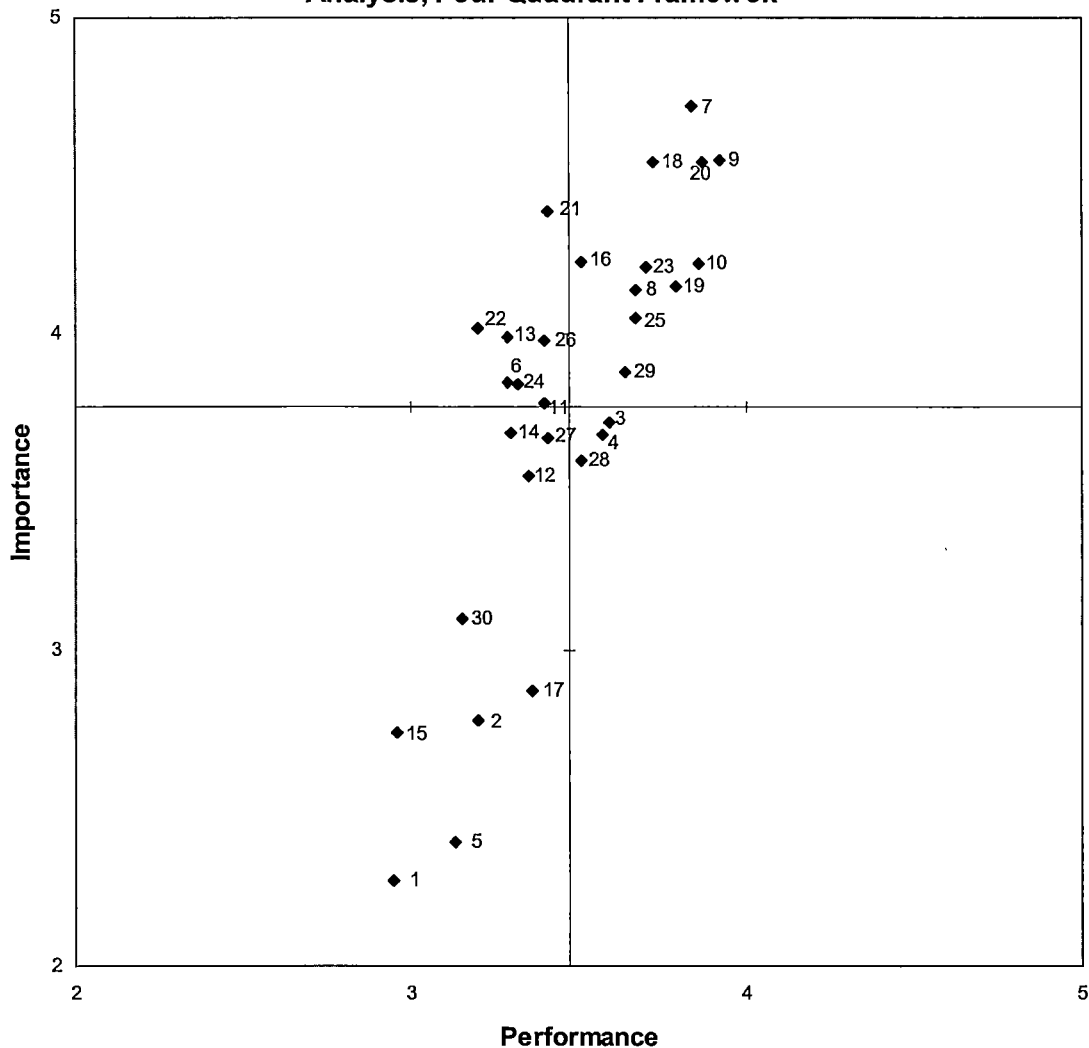
Results

General results from the VOBA survey, focusing on the five strategic level objectives, found that the public is divided in their opinions about the provision of access into national forests and grasslands. Many respondents made a distinction between access for motorized vehicles such as ATVs and non-motorized recreationalists. Access for motorized vehicles is viewed as unimportant, while access for non-motorized recreationalists is viewed as an important objective. Concerning the issue of preservation/conservation, the protection of ecosystems is seen as an important objective. Economic development and extractive uses are moderately supported by the public. Finally, education and natural resource management are both considered important objectives.

In order to add to these general survey results, this paper applies the importance-performance analysis to the VOBA survey data. The primary purpose of this is to supply managers with information on how the public views the relative importance of each objective, and the public's satisfaction with the Forest Service's performance for each objective, relative to others. This information will help provide managers with a more comprehensive picture of the public's opinion of national forest and grassland management.

Results are derived by from the importance-performance analysis are graphically illustrated in Figure 3.

Figure 3: VOBA Items Plotted on the Importance-Performance Analysis, Four Quadrant Framework



- | | |
|---|---|
| 1) Expand access for off-highway vehicles | 18) Develop volunteer programs to improve forests and grasslands |
| 2) Develop a trail system for motorized vehicles | 19) Develop volunteer programs to maintain trails and facilities |
| 3) Develop trail system for non-motorized recreation | 20) Inform public about recreation concerns |
| 4) Designate some trail for specific uses | 21) Inform public on environmental impacts |
| 5) Develop paved roads for cars/recreation vehicles | 22) Inform public on economic values of developing natural resources |
| 6) Designate more wilderness areas | 23) Encourage collaboration/information sharing |
| 7) Conserve/protect areas that are sources for water | 24) Use public advisory committees |
| 8) Policies such as no timber harvesting or no mining | 25) Allow for diverse uses |
| 9) Protect ecosystems and wildlife habitat | 26) Make management decisions at local level |
| 10) Preserve ability for a "wilderness" experience | 27) Increase acreage in the public land system |
| 11) Preserve cultural uses | 28) Pay an entry fee |
| 12) Provide natural resources to support communities | 29) Increase law enforcement efforts |
| 13) Restricting mineral development | 30) Allow public lands managers to trade public lands for private lands |
| 14) Restricting timber harvesting and grazing | |
| 15) Making the permitting process easier | |
| 16) Develop policy guiding resource development | |
| 17) Expand commercial recreation | |

Overall, general trends include the observation that the reported results on the graph fall from the bottom left to the top right. This configuration shows that generally the public rates Forest Service performance higher with objectives that they find more important and lower with objectives that are less important. This suggests that the Forest Service is aware of, and effectively managing many of the issues that are important to the public.

That said, there are a number of attributes that “Need management attention” (quadrant A) and a few that achieve “Possible overkill” (quadrant D). Thus, according to these results, the Forest Service could shift more attention to the designation of wilderness, preservation of cultural uses, restriction of mineral development, information sharing, and inclusion of locals in decision-making. Attention can be shifted from development of continuous trail systems for non-motorized recreation, designation of existing trails for specific use, and payment of entry fees to support public lands.

In order to make more specific interpretations of the results, Figure 4 re-visualizes the graphic results and states the strategic objective (in parenthesis) associated with each of the attributes.

Figure 4: Verbal Representation of the Importance-Performance Analysis

High Importance/ Low Performance	High Importance/ High Performance
<ul style="list-style-type: none"> • Designating wilderness (<i>Access</i>) • Preserving cultural uses (<i>Preservation/Conservation</i>) • Restricting mineral development (<i>Economic Development</i>) • Informing public on environmental impacts (<i>Education</i>) • Informing public on economic values (<i>Education</i>) • Using public advisory committees (<i>Natural Resource Management</i>) • Local decision making (<i>Natural Resource Management</i>) 	<ul style="list-style-type: none"> • Protecting water resources (<i>Preservation/Conservation</i>) • Preservation through no timber harvesting or mining policies (<i>Preservation/Conservation</i>) • Protecting ecosystems (<i>Preservation/Conservation</i>) • Ability for “wilderness” experience (<i>Preservation/Conservation</i>) • National policy to guide resource development (<i>Economic Development</i>) • Volunteer programs to improve forests/grasslands (<i>Education</i>) • Volunteer programs to maintain trails/facilities (<i>Education</i>) • Informing public about recreation concerns (<i>Education</i>) • Collaboration between groups (<i>Education</i>) • Diverse uses (<i>Natural Resource Management</i>) • Law enforcement (<i>Natural Resource Management</i>)

Figure 4 (cont.): Verbal Representation of the Importance-Performance Analysis

Low Importance/ Low Performance	Low Importance/ High Performance
<ul style="list-style-type: none"> • Access for motorized vehicles (<i>Access</i>) • Trail system for motorized vehicles (<i>Access</i>) • Paved roads (<i>Access</i>) • Provide resources to support local communities (<i>Economic Development</i>) • Restrict timber harvesting/grazing (<i>Economic Development</i>) • Making permit process easier (<i>Economic Development</i>) • Expanding commercial recreation (<i>Economic Development</i>) • Increasing number acres in system (<i>Natural Resource Management</i>) • Trade public for private lands (<i>Natural Resource Management</i>) 	<ul style="list-style-type: none"> • Trail system for non-motorized recreation (<i>Access</i>) • Designating trails for specific use (<i>Access</i>) • Paying entry fee for support (<i>Natural Resource Management</i>)

Access

The public views only one attribute pertaining to the strategic objective of access as highly important: "Designating more wilderness areas on public land that stops access for development and motorized uses." It is worthy of note that this attribute actually focuses on the limiting of access, not increasing access for stakeholders, and that the public is does not give the Forest Service a high performance rating for performance of this attribute. All other attributes pertaining to access are determined by the public to be less important. Of those, there are only two to which the public attaches a high performance rating. Overall, the Forest Service's performance concerning access issues is not highly rated.

Preservation/Conservation

The public rates every attribute within the Preservation/Conservation strategic objective as highly important. Given this result the fact that the public rates performance as high for all preservation/conservation issues except cultural issues, speaks to the effectiveness of the Forest Service's management policies. However, these results also suggest that it is vital that the Forest Service work to maintain their preservation/conservation practices.

Economic Development

The public generally does not view economic development on National Forests and Grasslands as very important. In addition, the two economic development attributes that the public rates as important both place checks on economic development within National Forests and Grasslands. The public believes that restricting mineral development on forests and grasslands, and that developing a national policy that guides natural resource development of all kinds are important. In contrast, economic development attributes

that are determined to be less important include providing natural resources to support communities depending on grazing, mining, or timber harvesting; making the permitting process easier for some established uses of forests and grasslands, and expanding commercial recreation on forests and grasslands. In addition, restricting timber harvesting and grazing on forests and grasslands is also rated as less important. Results also show that Forest Service performance concerning only one attribute, the development of a national policy that guides natural resources development, is highly rated. All other economic development attributes are rated as low performance—although as noted above, the majority of them are also considered less important, thus in the mind of the public, the Forest Service may be accurately judging the amount of attention given to these issues.

Education

Overall results suggest the public believes educational issues are highly important and that the Forest Service is doing a good job managing educational issues. High performance ratings are particularly evident with volunteer programs, somewhat less evident with level of information shared with the public. More specifically, the public believes that the Forest Service is doing a good job informing them about recreation concerns, but that the Forest Service could put more resources into providing information on environmental impacts and economic values concerning National Forests and Grasslands.

Natural Resource Management

Results for the final strategic objective, Natural Resources Management, are spread across the graph's four quadrants. Four of the attributes are considered more important: using public advisory committees to advise on public lands management issues, making management decisions at the local level rather than at the national level, allowing for diverse uses, and increasing law enforcement efforts. Three attributes are considered less important: increasing the total number of acres in the public land system, paying an entry fee to support public lands, and allowing public land managers to trade public lands for private lands. Similarly, the public gives the Forest Service high performance ratings on three attributes (diverse uses, law enforcement, and fees), and low performance ratings on four attributes (advisory committees, local decision making, numbers of acres within the system, and trade for private lands). Overall, results from the public suggest the Forest Service may want to put more attention into the advisory councils and local decision making, and spend fewer resources on the fee collection.

Discussion and Conclusions

Overall the results from this analysis show that the public places greater importance on issues surrounding preservation/conservation and education and less importance on issues of access and economic development. Similarly, the public rates Forest Service performance for preservation/conservation and education better than they rate the performance for economic development and access. These conclusions show that the Forest Service has been fairly effective in management decision-making and implementation. However, these conclusions also suggest that the Forest Service will

need to continue to focus on issues of preservation/conservation and education in order to satisfy the public in the future.

Although the interpretation of these results is fairly clear, it is important to mention the mandate of the Forest Service, and note that the mandate includes issues that are not always popular with all members of the public. Legally the Forest Service is directed to not only protect the forests and grasslands following the desires of the public, but also to guarantee multiple uses including recreation, ecosystem preservation, and economic development such as mining, timber harvesting, and grazing. Following this mandate, while also attempting to maintain a level of satisfaction with diverse stakeholders, is one of the more difficult aspects of the Forest Service's programs.

With public input becoming central to the development and maintenance of National Forest and Grassland management, it has become incumbent on management to obtain the most accurate information possible. The use of the Importance-Performance analysis can serve as one of the sources for such data collection. The analysis can function as a method to gather information from the public on not only what the public wants to see accomplished or maintained, but also on how to work toward accomplishing the Forest Service's mandate without reversing what the public views as positive achievements.

Citations

Fletcher, J.E., R.A. Kaiser, and S. Groger. 1992. "An assessment of the importance and performance of park impact fees in funding park and recreation infrastructure," *Journal of Park and Recreation Administration* 10(3): 75-87.

Guadagnolo, F. 1985. "The Importance-Performance Analysis: An Evaluation and Marketing Tool," *Journal of Park and Recreation Administration* 3(2): 13-22.

Hammit, W.E., R.D. Bixler, and F.P. Noe. 1996. "Going beyond importance-performance analysis to analyze the observance-influence of park impacts," *Journal of Park and Recreation Administration* 14(1): 45-62.

Havitz, M.E., G.D. Twynam, and J.M. DeLorenzo. 1991. "Important-Performance Analysis as a Staff Evaluation Tool," *Journal of Park and Recreation Administration* 9(1): 43-54.

Hollenhorst, S., D. Olson, and R. Fortney. 1992. "Use of Importance-Performance Analysis to Evaluate State Park Cabins: The Case of the West Virginia Park System," *Journal of Park and Recreation Administration* 10(1): 1-11.

Leeworthy, V.R. and P.C. Wiley. 1996. "Importance and Satisfaction Ratings by Recreating Visitors to the Florida Keys/Key West." Silver Spring, MD: US Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Ocean Resources Conservation and Assessment, Strategic Environmental Assessments Division.

_____. 1995. "A Socioeconomic Profile of Recreationists at Cumberland Island National Seashore." Silver Spring, MD: National Oceanic and Atmospheric Administration.

_____. 1994. "A Socioeconomic Profile of Recreationists at Sonoma Coast State Beach." Silver Spring, MD: National Oceanic and Atmospheric Administration.

Marcouiller, D. and T. Mace. 1999. "Forests and regional development: Economic impacts of woodland use for recreation and timber in Wisconsin." Madison, WI: University of Wisconsin—Extension, Cooperative Extension. (Retrieved on line November 13, 2003: www.uwex.edu/ces/pubs/pdf/g3694.pdf)

Martilla, J.A. and J.C. James. 1977. "Importance-Performance Analysis," *Journal of Marketing* 41(1): 77-79.

Mengak, K.K., F.D. Dottavio, and J.T. O'Leary. 1986. "Use of importance-performance analysis to evaluate a visitor center," *Journal of Interpretation* 11(2): 1-13.

Probst, D.E. and D.W. Lime. 1982. "How satisfying is satisfaction research? A look at where we are going." Forest and River Recreation Research Update, Miscellaneous Publication 18, University of Minnesota Agricultural Experiment Station, St. Paul, MN. Pages 124-133.

Richardson, S.L. 1987. "An Importance-Performance Approach to Evaluating Communication Effectiveness," *Journal of Park and Recreation Administration* 5(4): 71-83.

Shields, D.J., I.M. Martin, W.E. Martin, and M.A. Haeffele. 2002. *Survey Results of the American Public's Values, Objectives, Beliefs, and Attitudes Regarding Forests and Grasslands: A Technical Document Supporting the 2000 USDA Forest Service RPA Assessment*. Gen. Tech. Rep. RMRS-GTR-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 111p.

Shores Hunt, K., D. Scott, and S. Richardson. 2003. "Position Public Recreation and Park Offerings Using Importance-Performance Analysis," *Journal of Park and Recreation Administration* 21(3): 1-21.

Tarrant, M.A. and E.K. Smith. 2002. "The use of a modified importance-performance framework to examine visitor satisfaction with attributes of outdoor recreation settings," *Managing Leisure* 7: 69-82.

Taylor, J.G. and A.J. Douglas. 1999. "Diversifying Natural Resources Value Measurements: The Trinity River Study," *Society and Natural Resources* 12: 315-336.

Wiley, P.C. and V. R. Leeworthy. 1998. "Visitor Profiles: Everglades National Park." Silver Spring, MD: US Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Ocean Resources Conservation and Assessment, Strategic Environmental Assessments Division.

Appendix A: VOA Statements for the NSRE Survey

1. Expanding access for motorized off-highway vehicles on forests and grasslands (for example, snowmobiling or 4-wheel driving).
2. Developing and maintaining continuous trail systems that cross both public and private land for motorized vehicles such as snowmobiles or ATVs.
3. Developing and maintaining continuous trail systems that cross both public and private land for non-motorized recreation such as hiking or cross-country skiing.
4. Designating some existing recreation trails for specific use (for example, creating separate trails for snowmobiling and cross-country skiing, or for mountain biking and horse-back riding).
5. Developing new paved roads on forests and grasslands for access for cars and recreational vehicles.
6. Designating more wilderness areas on public land that stops access for development and motorized uses.
7. Conserving and protecting forests and grasslands that are the source of our water resources, such as streams, lakes, and watershed areas.
8. Preserving the natural resources of forests and grasslands through such policies as no timber harvesting or no mining.
9. Protecting ecosystems and wildlife habitat.
10. Preserving the ability to have a "wilderness" experience on forests and grasslands.
11. Preserving eth cultural uses of forests and grasslands by Native Americans and Native Hispanics such as firewood gathering, herb/berry/plant gathering, and ceremonial access.
12. Providing natural resources from forests and grasslands to support communities dependent on grazing, mining, or timber harvesting.
13. Restricting mineral development on forests and grasslands.
14. Restricting timber harvesting and grazing on forests and grasslands.
15. Making the permitting process easier for some established uses of forests and grasslands such as grazing, logging, mining, and commercial recreation.
16. Developing a national policy that guides natural resource development of all kinds (for example, specifies levels of extraction and regulates environmental impacts).
17. Expanding commercial recreation on forests and grasslands (for example, ski areas, guide services, or outfitters).
18. Developing volunteer programs to improve forests and grasslands (for example, planting trees or improving water quality).
19. Developing volunteer programs to maintain trails and facilities on forests and grasslands (for example, trail maintenance or campground maintenance).
20. Informing the public about recreation concerns on forests and grasslands such as safety, trail etiquette, and respect for wildlife.
21. Informing the public on the potential environmental impacts of all uses associated with forests and grasslands.
22. Informing the public on the economic value received by developing our natural resources.
23. Encouraging collaboration between groups in order to share information concerning uses of forests and grasslands.

24. Using public advisory committees to advise on public land management issues.
25. Allowing for diverse uses of forests and grasslands such as grazing, recreation, and wildlife habitat.
26. Making management decisions concerning the use of forests and grasslands at the local level rather than at the national level.
27. Increasing the total number of acres in the public land system.
28. Paying an entry fee that goes to support public land.
29. Increasing law enforcement efforts by public land agencies on public lands.
30. Allowing public land managers to trade public lands for private lands (for example, to eliminate private property within public land boundaries or to acquire unique areas of land).

Appendix B: VOBA's Five Strategic Level Objectives and the Corresponding Objectives

Strategic Objective 1: Access
1. Expanding access for motorized off-highway vehicles on forests and grasslands (for example snowmobiling or 4-wheel driving).
2. Developing and maintaining continuous trail systems that cross both public and private land for motorized vehicles such as snowmobiles or ATVs.
3. Developing and maintaining continuous trail systems that cross both public and private land for non-motorized recreation such as hiking and cross-country skiing.
4. Designating some existing recreation trails for specific uses (for example, creating separate trails for snowmobiling and cross-country skiing, or for mountain biking and horseback riding).
5. Developing new paved roads on forests and grasslands for access for cars and recreational vehicles.
6. Designating more wilderness areas on public land that stops access for development and motorized uses.
Strategic Objective 2: Preservation / Conservation
7. Conserving and protecting forests and grasslands that are the source of our water resources, such as streams, lakes, and watershed areas.
8. Preserving the natural resources of forests and grasslands through such policies as no timber harvesting or mining.
9. Protecting ecosystems and wildlife habitats.
10. Preserving the ability to have a wilderness experience on forests and grasslands.
11. Preserving the cultural uses of forests and grasslands by Native Americans and Native Hispanics such as firewood gathering, herb/berry/plant gathering, and ceremonial access.
Strategic Objective 3: Economic Development
12. Providing natural resources from forests and grasslands to support communities depending on grazing, mining, or timber harvesting.
13. Restricting mineral development on forests and grasslands.
14. Restricting timber harvesting and grazing on forests and grasslands.
15. Making the permitting process easier for some established uses of forests and grasslands such as grazing, mining, and commercial recreation.
16. Developing a national policy that guides natural resource development of all kinds (for example, specifies levels of extraction and regulates environmental impacts).
17. Expanding commercial recreation on forests and grasslands (for example, ski areas, guide services, or outfitters).
Strategic Objective 4: Education
18. Developing volunteer programs to improve forests and grasslands (for example, planting trees, or improving water quality).
19. Developing volunteer programs to maintain trails and facilities on forests and grasslands (for example, trail maintenance or campground maintenance).

20. Informing the public about recreation concerns on forests and grasslands such as safety, trail etiquette, and respect for wildlife.
21. Informing the public on the potential environmental impacts of all uses associated with forests and grasslands.
22. Informing the public on the economic value received by developing our natural resources.
23. Encouraging collaboration between groups in order to share information concerning uses of forests and grasslands.
Strategic Objective 5: Natural Resource Management
24. Using public advisory committees to advise on public land management issues.
25. Allowing for diverse uses of forests and grasslands such as grazing, recreation, and wildlife habitat.
26. Making management decisions concerning the use of forests and grasslands at the local level rather than at the national level.
27. Increasing the total number of acres in the public land system.
28. Paying an entry fee that goes to support public land.
29. Increasing law enforcement efforts by public land agencies on public lands.
30. Allowing public land managers to trade public lands for private lands (for example, to eliminate private property within public land boundaries, or to acquire unique areas of land).

Source: Shields, Martin, Martin, Haeffele 2002, 25-26.